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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/696,215

10/28/2003

Devlin M. Gualtieri

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EXAMINER

SCHINDLER, DAVID M

ART UNIT

PAPER NUMBER

2862

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/696,215	Applicant(s) GUALTIERI, DEVLIN M.	
	Examiner DAVID M. SCHINDLER	Art Unit 2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-14, 16 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-14, 16 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the communication filed 6/20/2008.

Response to Arguments

2. Applicant's arguments filed 6/20/2008 have been fully considered but they are not persuasive.

3. In the previous office action, only the teaching, motivation, or suggestion (TSM) test was utilized, and it is this response that will be addressed (see page 5 of applicant's remarks). Applicant argues that there is no teaching, suggestion, or motivation rationale, and that is unclear why a person of ordinary skill in the art of turbine blade proximity detection and control would even look to fluid flow sensors for solutions to a problem. The Examiner respectfully disagrees. All three applied references (Ham et al. (3,177,711), Miyata et al. (4,324,144), and Stowell (4,842,477)) are analogous as they all relate to turbine blade sensing. Furthermore, a person of ordinary skill in the art would have, at the time of invention, been motivated to combine the references for the reasons stated in the rejection below. For example, Stowell discloses controlling the proximity of the turbine blades to a non-rotating turbine component, and it would have been obvious to

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combine Stowell into Ham in view of Miyata to prevent turbine malfunction by preventing blade damage.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 11, 12, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ham et al. (Ham) (3,177,711) in view of Miyata et al. (Miyata) (4,324,144) and Stowell (4,842,477).

7. As to Claim 11,

8. Ham discloses a sensor coil (20), an oscillator circuit

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including a capacitive circuit element (44) electrically coupled in parallel with the sensor coil to thereby form a parallel-resonant LC tank circuit (Figure) having a resonant frequency that varies with the proximity of the sensor coil to each of the turbine blades (Column 3, Lines 36-58).

9. Ham does not explicitly disclose the oscillator circuit operable to generate and supply a sensor signal having a frequency that varies based on the resonant frequency of the parallel-resonant LC tank circuit, whereby the sensor signal is a frequency modulated sensor signal, and a frequency modulation (FM) demodulator adapted to receive the frequency modulated sensor signal and operable, in response thereto, to supply a proximity signal having an amplitude that varies with, and is representative of, the proximity of each of the turbine blades to the non-rotating turbine component, and a controller coupled to receive the proximity signal from the FM detector and operable, in response thereto, to control the proximity of the turbine blades to the non-rotating turbine component.

10. Miyata discloses the oscillator circuit (Figure 2) operable to generate and supply a sensor signal having a frequency that varies based on the resonant frequency of the parallel-resonant LC tank circuit (Column 3, Lines 33-60), whereby the sensor signal is a frequency modulated sensor signal, and a frequency

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modulation (FM) demodulator adapted to receive the frequency modulated sensor signal and operable, in response thereto, to supply a proximity signal having an amplitude that varies with, and is representative of, the proximity of each of the turbine blades to the non-rotating turbine component ((Figures 1 and 2) and (Column 3, Lines 33-60)).

11. It would have been obvious to a person of ordinary skill in the art at the time of invention to modify to add the feature of the oscillator circuit operable to generate and supply a sensor signal having a frequency that varies based on the resonant frequency of the parallel-resonant LC tank circuit, whereby the sensor signal is a frequency modulated sensor signal, and a frequency modulation (FM) demodulator adapted to receive the frequency modulated sensor signal and operable, in response thereto, to supply a proximity signal having an amplitude that varies with, and is representative of, the proximity of each of the turbine blades to the non-rotating turbine component as taught by Miyata in order to issue pulse voltage signals proportional to the number of the blades which have passed the detector (Column 3, Lines 61-65).

12. Stowell discloses controlling the proximity of the turbine blades to the non-rotating turbine component (Abstract, Lines 10-15).

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13. It would have been obvious to a person of ordinary skill in the art to modify Ham in view of Miyata to include a controller to control the proximity of the turbine blades to the non-rotating turbine component given the above disclosure and the teaching of Stowell in order to prevent turbine malfunction by preventing blade damage.

14. As to Claim 12,

15. Ham discloses the non-rotating component is either a turbine case or a component coupled to the turbine shroud (Figure).

16. Ham does not disclose the controller controls the proximity of the turbine blades to the non-rotating turbine component by controlling turbine shroud temperature.

17. Stowell discloses controlling the proximity of the turbine blades to the non-rotating component by controlling turbine shroud temperature (Abstract, Lines 10-15).

18. It would have been obvious to a person of ordinary skill in the art to modify Ham to include the non-rotating component is either a turbine case or a component coupled to the turbine shroud, and the controller controls the proximity of the turbine blades to the non-rotating turbine component by controlling turbine shroud temperature given the above disclosure and

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teaching of Stowell in order to prevent turbine malfunction by preventing blade damage.

19. As to Claim 20,

20. Ham discloses a turbine case (Figure), a turbine wheel rotationally mounted within the turbine case (Figure), a plurality of turbine blades extending from the turbine wheel toward the turbine case (Figure), and a turbine blade proximity sensor system including a sensor coil (20) disposed at least partially within the turbine case,, an oscillator circuit including a capacitive circuit element (44) electrically coupled in parallel with the sensor coil to thereby form a parallel-resonant LC tank circuit (Figure) having a resonant frequency that varies with the proximity of the sensor coil to each of the turbine blades (Column 3, Lines 36-58).

21. Ham does not explicitly disclose the oscillator circuit operable to generate and supply a sensor signal having a frequency that varies based on the resonant frequency of the parallel-resonant LC tank circuit, whereby the sensor signal is a frequency modulated sensor signal, and a frequency modulation (FM) demodulator coupled to receive the frequency modulated sensor signal and operable, in response thereto, to supply a proximity signal having an amplitude that varies with, and is representative of, the proximity of each of the turbine blades

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to the turbine case or one of the components mounted thereto, and a controller coupled to receive the proximity signal from the FM detector and operable, in response thereto, to control the proximity of each of the turbine blades to either the turbine case or one or more components mounted thereto.

22. Miyata discloses the oscillator circuit (Figure 2) operable to generate and supply a sensor signal having a frequency that varies based on the resonant frequency of the parallel-resonant LC tank circuit (Column 3, Lines 33-60), whereby the sensor signal is a frequency modulated sensor signal, and a frequency modulation (FM) demodulator coupled to receive the frequency modulated sensor signal and operable, in response thereto, to supply a proximity signal having an amplitude that varies with, and is representative of, the proximity of each of the turbine blades to the turbine case or one of the components mounted thereto ((Figures 1 and 2) and (Column 3, Lines 33-60)).

23. It would have been obvious to a person of ordinary skill in the art at the time of invention to modify to add the feature of the oscillator circuit operable to generate and supply a sensor signal having a frequency that varies based on the resonant frequency of the parallel-resonant LC tank circuit, whereby the sensor signal is a frequency modulated sensor signal, and a frequency modulation (FM) demodulator coupled to receive the

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frequency modulated sensor signal and operable, in response thereto, to supply a proximity signal having an amplitude that varies with, and is representative of, the proximity of each of the turbine blades to the turbine case or one of the components mounted thereto as taught by Miyata in order to issue pulse voltage signals proportional to the number of the blades which have passed the detector (Column 3, Lines 61-65).

24. Stowell discloses a controller to control the proximity of the turbine blades to the turbine case (Abstract, Lines 10-15).

25. It would have been obvious to a person of ordinary skill in the art to modify Ham in view of Miyata to include a controller coupled to receive the proximity signal from the FM detector and operable, in response thereto, to control the proximity of each of the turbine blades to either the turbine case given the above disclosure and the teaching of Stowell in order to prevent turbine malfunction by preventing blade damage.

26. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ham et al. (Ham) (3,177,711) in view of Miyata et al. (Miyata) (4,324,144) and Stowell (4,842,477) as applied to claim 12 and in further view of Davison (4,230,436).

27. Ham in view of Miyata and Stowell does not disclose the controller, in response to the proximity signal, supplies one or

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more valve control signals, and wherein the system includes one or more valves in fluid communication between a cooling air source and the turbine shroud, each valve having an actuator coupled to receive one or more of the valve control signals and operable, in response thereto, to selectively move its associated valve between an open position and a closed position, to thereby selectively cool the turbine case.

28. Davison discloses one valve in fluid communication between a cooling air source, the valve having an actuator that selectively moves the valve between an open position and a closed position, to thereby selectively maintain optimum rotor-to-shroud clearances ((Figures 1 and 8A-8C) and (Column 6, Lines 28-33) and (Column 8, 24-30) and (Abstract, Lines 4-11)).

29. It would have been obvious to a person of ordinary skill in the art to modify Ham in view of Miyata and Stowell to include the controller, in response to the proximity signal, supplies one or more valve control signals, and wherein the system includes one or more valves in fluid communication between a cooling air source and the turbine shroud, each valve having an actuator coupled to receive one or more of the valve control signals and operable, in response thereto, to selectively move its associated valve between an open position and a closed position, to thereby selectively cool the turbine case given the

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above disclosure and teaching of Davison in order to prevent turbine malfunction by preventing blade damage.

30. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ham et al. (Ham) (3,177,711) in view of Miyata et al. (Miyata) (4,324,144) and Stowell (4,842,477) as applied to claim 11 and in further view of Oates et al. (Oates) (4,644,270).

31. Ham in view of Miyata and Stowell do not disclose a display coupled to receive the proximity signal from the FM demodulator and operable, in response thereto, to supply a visual display of the proximity of each of the turbine blades to the turbine shroud.

32. Oates discloses a display coupled to receive the proximity signal from a detector and operable, in response thereto, to supply a visual display of the proximity of each of the turbine blades to the turbine shroud (Column 11, Lines 19-32).

33. It would have been obvious to a person of ordinary skill in the art to modify Ham in view of Miyata and Stowell to include a display coupled to receive the proximity signal from the FM demodulator and operable, in response thereto, to supply a visual display of the proximity of each of the turbine blades to the turbine shroud given the above disclosure and teaching of

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Oates in order to allow for the monitoring of blading arrangements on turbines (Column 1, Lines 11-13).

34. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ham et al. (Ham) (3,177,711) in view of Miyata et al. (Miyata) (4,324,144) and Stowell (4,842,477) as applied to claim 11 and in further view of Barclay et al. (Barclay) (5,854,553).

35. Ham in view of Miyata and Stowell does not disclose a coaxial cable coupled between the sensor coil and the oscillator circuit, the coaxial cable having a capacitance that acts as at least one of the capacitance circuit elements.

36. Barclay discloses a coaxial cable coupled between the sensor coil and the oscillator circuit, the coaxial cable having a capacitance that acts as at least one of the capacitance circuit elements ((Figures 1b and 2) and (Column 5, Lines 13-30)).

37. It would have been obvious to a person of ordinary skill in the art to modify Ham in view of Miyata and Stowell to include a coaxial cable coupled between the sensor coil and the oscillator circuit, the coaxial cable having a capacitance that acts as at least one of the capacitance circuit elements as taught by

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Barclay in order to reduce the number of components necessary to form a desired resonant circuit (note Column 5, Lines 26-41).

38. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ham et al. (Ham) (3,177,711) in view of Miyata et al. (Miyata) (4,324,144) and Stowell (4,842,477) as applied to claim 11 and in further view of Wilkinson (GB 2167603 A).

39. Ham in view of Miyata and Stowell does not disclose a ceramic core, and a conductor selected from a group consisting of platinum and molybdenum.

40. Wilkinson discloses a ceramic core and a conductor consisting of platinum (Page 1, Left Column, Lines 51-54).

41. It would have been obvious to a person of ordinary skill in the art to modify Ham in view of Miyata and Stowell to include a ceramic core and a conductor consisting of platinum as taught by Wilkinson in order to have a sensor that gives a fast and accurate response and can withstand corrosive environments (Page 1, Left Column, Lines 29-33).

42. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ham et al. (Ham) (3,177,711) in view of Miyata et al. (Miyata) (4,324,144) and Stowell (4,842,477) as applied to claim 11 and in further view of Schroeder (6,486,657).

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43. Ham in view of Miyata and Stowell do not disclose a peak detector coupled to receive the proximity signal and operable, in response thereto, to determine a peak value of the proximity signal.

44. Schroeder discloses a peak detector (30) coupled to receive the proximity signal and operable, in response thereto, to determine a peak value of the proximity signal ((Column 4, Lines 55-67) and (Column 5, Lines 1-15)).

45. It would have been obvious to a person of ordinary skill to modify Ham in view of Miyata and Stowell to include a peak detector coupled to receive the proximity signal and operable, in response thereto, to determine a peak value of the proximity signal as taught by Schroeder in order to provide a failure circuit that provides for the recognition of failure modes (Column 5, Lines 7-11).

Conclusion

46. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

47. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this

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action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

48. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID M. SCHINDLER whose telephone number is (571)272-2112. The examiner can normally be reached on Monday-Friday (8:00AM-5:00PM).

49. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Assouad can be reached on (571) 272-2210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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50. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David M. Schindler
Examiner
Art Unit 2862

DMS

/Patrick J Assouad/
Supervisory Patent Examiner, Art Unit 2862